

# VA/DOD CLINICAL PRACTICE GUIDELINE FOR THE MANAGEMENT OF ISCHEMIC HEART DISEASE MODULE C SUMMARY

## STABLE ANGINA

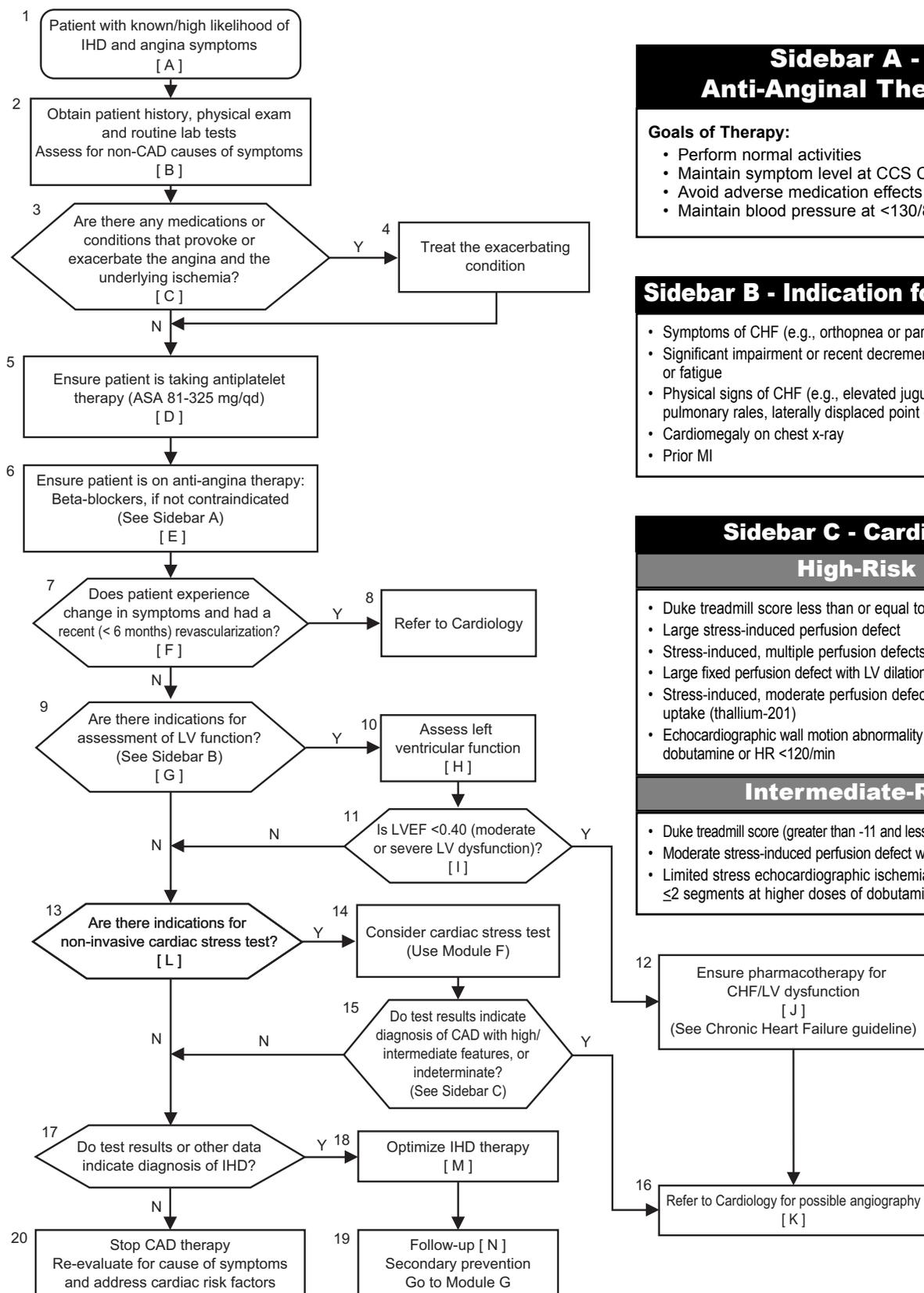
Patients with known ischemic heart disease (IHD), or with a high likelihood of IHD based on clinical factors, who have stable symptoms (referred to as angina) that suggest transient myocardial ischemia are managed within this module. Most commonly, angina is described as a squeezing, heavy, or aching substernal discomfort that is provoked by physical or emotional stress and is relieved by rest and/or sublingual nitroglycerin. Symptoms may also radiate to or be felt exclusively in the jaw, shoulders, arms, or back. Patients may also experience concurrent dyspnea, diaphoresis, or nausea. Occasionally, transient myocardial ischemia may manifest solely as one of these latter symptoms, especially as dyspnea on exertion; in such cases, the symptoms are described as "anginal equivalents" (AHCPR USA, 1994; ACC/AHA Stable Angina, 1999).

This module is not intended for the management of patients with unstable angina. Unstable angina should be suspected when patients have either prolonged angina (i.e., >20 minutes) or new onset or increasing angina, which occurs either at rest or with minimal exertion. These patients should be managed in Module B (Suspected Acute Coronary Syndrome: Unstable Angina/Non-ST-Segment Elevation MI).

# MANAGEMENT OF ISCHEMIC HEART DISEASE

## MODULE C: MANAGEMENT OF STABLE ANGINA

# C



### Sidebar A - Anti-Anginal Therapy

**Goals of Therapy:**

- Perform normal activities
- Maintain symptom level at CCS Class I
- Avoid adverse medication effects
- Maintain blood pressure at <130/85 & pulse <70

### Sidebar B - Indication for Assessment of LVF

- Symptoms of CHF (e.g., orthopnea or paroxysmal nocturnal dyspnea)
- Significant impairment or recent decrement in exercise tolerance, due to dyspnea or fatigue
- Physical signs of CHF (e.g., elevated jugular venous pressure, unexplained pulmonary rales, laterally displaced point of maximal impulse, and S3 gallop)
- Cardiomegaly on chest x-ray
- Prior MI

### Sidebar C - Cardiac Stress Test

#### High-Risk Findings

- Duke treadmill score less than or equal to -11 (estimated annual mortality >3%)
- Large stress-induced perfusion defect
- Stress-induced, multiple perfusion defects of moderate size
- Large fixed perfusion defect with LV dilation or increased lung uptake (thallium-201)
- Stress-induced, moderate perfusion defect with LV dilation or increased lung uptake (thallium-201)
- Echocardiographic wall motion abnormality involving >2 segments at ≤10 mg/kg/min dobutamine or HR <120/min

#### Intermediate-Risk Findings

- Duke treadmill score (greater than -11 and less than 5) (estimated annual mortality 1-3%)
- Moderate stress-induced perfusion defect without LV dilation or increased lung uptake
- Limited stress echocardiographic ischemia with wall motion abnormality involving ≤2 segments at higher doses of dobutamine (>10 mg/kg/min dobutamine)

## ASSESSMENT

### **Patient History, Physical Exam, And Routine Laboratory Tests; Assess For Non-Coronary Artery Disease (CAD) Causes Of Symptoms**

Patients with IHD may also experience symptoms unrelated to transient myocardial ischemia, but which nonetheless raise concern regarding the possibility of angina and therefore pose diagnostic difficulties. Many conditions other than coronary disease present with chest pain or discomfort that mimic angina symptoms. The history and physical examination should be used to develop a differential diagnosis of the patient's symptoms.

#### **Obtain the following history for all patients with suspected angina:**

- A detailed chest pain history, to include character, frequency, location, duration, radiation of pain, and provoking and relieving factors (i.e., exercise, emotion, and response to sublingual nitroglycerin)
- History of prior myocardial infarction
- History of prior myocardial revascularization
- History of prior diagnostic testing for IHD
- Assessment for coronary risk factors (e.g., hyperlipidemia, diabetes, smoking, hypertension, and family history of premature coronary disease)
- History of symptoms suggestive of heart failure
- History of cerebral or peripheral vascular disease

#### **History that may be helpful for the evaluation of potential non-cardiac causes for symptoms in some patients includes the following:**

- Medications, over-the-counter drugs, and substance use
- Anemia (fatigue, weakness, bleeding disorders, menstrual flow, hematuria, hematochezia, and nutrition)
- Thyroid disease (diaphoresis, nervousness, insomnia, weight loss, and neck pain)
- Pulmonary disease (smoking, wheezing, coughing, pleuritic chest pain, exposure to tuberculosis, and hemoptysis)

- Gastrointestinal disorders (relationship between pain or discomfort and meals, melena, hematochezia, and heartburn)
- Other possible non-cardiac sources of chest pain or discomfort

#### **Physical examination components include the following:**

- Blood pressure, pulse rate and regularity, and respiratory rate
- Complete cardiac exam for the presence of cardiac enlargement, murmurs, extra heart sounds, etc.
- Evaluation of the carotid and jugular vessels for the presence of jugular venous distention, carotid bruits, and abnormal carotid pulsations
- Peripheral vascular evaluation, including assessment of pulse quality and presence of bruits
- Evaluation for peripheral edema
- Thyroid examination (e.g., tenderness and enlargement)
- Abdominal examination (e.g., bruits, tenderness, and masses)
- Pulmonary/thoracic examination (e.g., pulmonary congestion rubs, chest wall tenderness, and skin lesions)

#### **Obtain the following laboratory tests, if not previously done:**

- Complete blood count
- Fasting glucose
- Fasting lipid profile including triglycerides
- 12-lead electrocardiogram (ECG)
- Chest x-ray in patients with signs of heart failure, valvular heart disease, pericardial disease, or aortic dissection/aneurysm

#### **Obtain additional laboratory tests, as clinically indicated, to include the following:**

- Renal panel including electrolytes
- Liver Function Tests
- Thyroid Function Tests
- Drug screening
- Amylase/lipase

**Features that are not characteristic of myocardial ischemia include the following:**

- Pleuritic pain (i.e., sharp or knife-like pain brought on by respiratory movements or a cough)
- Primary or sole location of discomfort in the middle or lower abdominal regions
- Pain that may be localized at the tip of one finger, particularly over the left ventricular apex
- Pain reproduced with movement or palpation of the chest wall or arms
- Constant pain that lasts for many hours
- Very brief episodes of pain that last a few seconds or less
- Pain that radiates into the lower extremities

**Table 1. Alternative Diagnoses to Angina for Patients with Chest Pain or Discomfort (adapted from ACC/AHA Stable Angina, 1999)**

Non-ischemic Cardiovascular	Pulmonary	Gastrointestinal	Chest Wall	Psychiatric
<ul style="list-style-type: none"> <li>• Aortic dissection</li> <li>• Pericarditis</li> </ul>	<ul style="list-style-type: none"> <li>• Pulmonary embolus</li> <li>• Pneumothorax</li> <li>• Pneumonia</li> <li>• Pleuritis</li> </ul>	<ul style="list-style-type: none"> <li>• Esophageal                             <ul style="list-style-type: none"> <li>-Esophagitis</li> <li>-Spasm</li> <li>-Reflux</li> </ul> </li> <li>• Biliary                             <ul style="list-style-type: none"> <li>-Colic</li> <li>-Cholecystitis</li> <li>-Cholecholithiasis</li> <li>-Cholangitis</li> </ul> </li> <li>• Peptic ulcer</li> <li>• Pancreatitis</li> </ul>	<ul style="list-style-type: none"> <li>• Costochondritis</li> <li>• Fibrositis</li> <li>• Rib fracture</li> <li>• Sternoclavicular arthritis</li> <li>• Herpes zoster (before the rash)</li> </ul>	<ul style="list-style-type: none"> <li>• Anxiety disorder                             <ul style="list-style-type: none"> <li>- Hyperventilation</li> <li>- Panic disorder</li> <li>- Primary anxiety</li> </ul> </li> <li>• Affective disorders (e.g., depression)</li> <li>• Somatoform disorders</li> <li>• Thought disorders (e.g., fixed delusion)</li> </ul>

**Medications Or Conditions That Provoke Or Exacerbate The Angina And The Underlying Ischemia**

In addition to non-CAD conditions, whose symptoms mimic the symptoms of angina, there are many conditions that may provoke or exacerbate angina and the underlying

ischemia, even though the existing coronary disease is not otherwise significant. In particular, conditions that increase oxygen demand or decrease oxygen supply may provoke ischemic symptoms in patients who otherwise would not have symptoms, if based exclusively on atherosclerotic lesions.

**Table 2. Conditions and Medications Provoking or Exacerbating Ischemia (adapted from the ACC/AHA Stable Angina Guidelines, 1999)**

INCREASED OXYGEN DEMAND	DECREASED OXYGEN SUPPLY
<p><b>Noncardiac</b></p> <ul style="list-style-type: none"> <li>• Hyperthermia</li> <li>• Hyperthyroidism</li> <li>• Sympathomimetic toxicity (e.g., cocaine use)</li> <li>• Hypertension</li> <li>• Anxiety</li> <li>• Arteriovenous fistulae</li> </ul> <p><b>Cardiac</b></p> <ul style="list-style-type: none"> <li>• Hypertrophic cardiomyopathy</li> <li>• Aortic stenosis</li> <li>• Dilated cardiomyopathy</li> <li>• Tachycardia               <ul style="list-style-type: none"> <li>- Ventricular</li> <li>- Supraventricular</li> </ul> </li> </ul> <p><b>Medications</b></p> <ul style="list-style-type: none"> <li>• Vasodilators</li> <li>• Excessive thyroid replacement</li> </ul>	<p><b>Noncardiac</b></p> <ul style="list-style-type: none"> <li>• Anemia</li> <li>• Hypoxemia               <ul style="list-style-type: none"> <li>- Pneumonia</li> <li>- Asthma</li> <li>- Chronic obstructive pulmonary disease</li> <li>- Pulmonary hypertension</li> <li>- Interstitial pulmonary fibrosis</li> <li>- Obstructive sleep apnea</li> </ul> </li> <li>• Sickle cell disease</li> <li>• Sympathomimetic toxicity (e.g., cocaine use)</li> <li>• Hyperviscosity               <ul style="list-style-type: none"> <li>- Polycythemia</li> <li>- Leukemia</li> <li>- Thrombocytosis</li> <li>- Hypergammaglobulinemia</li> </ul> </li> </ul> <p><b>Cardiac</b></p> <ul style="list-style-type: none"> <li>• Aortic stenosis</li> <li>• Hypertrophic cardiomyopathy</li> </ul> <p><b>Medications</b></p> <ul style="list-style-type: none"> <li>• Vasoconstrictors</li> </ul>

## TREATMENT

### ENSURE PATIENT IS TAKING ANTIPLATELET THERAPY

#### Aspirin (ASA) 81 to 325 mg qd

Aspirin is known to be effective for reducing mortality in patients with CAD. Use of aspirin has been associated with a decrease in nonfatal MI, nonfatal stroke, and vascular death. The doses used ranged from 81 mg to 325 mg per day and doses throughout this range appeared to have similar effect .

For patients who require warfarin therapy, aspirin may be safely used at a dose of 80 mg/day .

If use of aspirin is contraindicated, **clopidogrel** may be used. Although it has not been studied in stable angina patients, in a large randomized controlled study of more than 19,000 patients with a history of ischemic stroke, MI, or atherosclerotic peripheral arterial disease, clopidogrel (75 mg daily) demonstrated a relative-risk reduction of 8.7% when compared with aspirin (325 mg daily).

### ENSURE PATIENT IS TAKING ADEQUATE ANTI-ANGINAL THERAPY

Treatment should be individualized. In general, the goal of adequate therapy is to allow the patient to perform normal activity and to be maintained at a symptom level of Canadian Cardiovascular Society (CCS) class I, with minimum adverse effects, BP >130/85 and pulse <70.

#### Beta-Blockers

Beta-blockers should be prescribed in all patients (with or without prior MI), in the absence of known contraindications. Beta-blockers are effective in controlling exercise-induced angina. In addition, they have been shown to decrease mortality in post-MI patients. In patients with chronic obstructive pulmonary disease, including those with a reactive airway component, beta-blockers with selective beta-1 antagonist properties may be used judiciously.

#### Nitroglycerin As Needed (PRN)

Short-acting nitroglycerin in sublingual, buccal, or spray form is known to be effective in the treatment of symptoms of acute angina, on an as-needed basis.

#### Long-Acting Nitrates

If optimal doses of beta-blockers fail to adequately control symptoms or adverse drug events, long-acting nitrates should be added. Long-acting nitrates have no proven affect on long-term survival, however; therefore emphasis should be placed on optimized beta-blockers as much as possible.

#### Calcium Channel-Blockers

If optimal doses of beta-blockers or long-acting nitrates fail to adequately control symptoms or are not tolerated, calcium channel-blocking agents may be used as adjunctive therapy. Long-acting non-dihydropyridine calcium antagonists are preferred over dihydropyridine calcium antagonists. Short-acting dihydropyridine calcium antagonists should be avoided.

#### ACE-Inhibitors

Angiotensin-converting enzyme (ACE)-inhibitors should be used for all patients with CAD who also have diabetes and/or left ventricular systolic dysfunction. ACE-inhibitors should also be considered in patients with CAD and other vascular disease in the absence of left ventricular dysfunction. ACE-inhibitors have been shown to improve outcomes in these patients, although ACE-inhibitors should not be considered anti-anginal drugs.

#### Lipid-Lowering Therapy

In patients with established coronary disease, including chronic stable angina pectoris, dietary intervention and treatment with lipid-lowering medications should not be limited to those with extreme values. The clinical trial data establish the benefits of aggressive lipid-lowering treatment for most coronary disease patients, even when LDL-cholesterol is within a range considered acceptable for patients in a primary prevention setting. For patients with established coronary disease, nonpharmaceutical

treatment should be initiated when LDL-cholesterol is >100 mg/dL, and drug treatment is warranted when LDL-cholesterol is >130 mg/dL and may be considered for LDL-C 100 to 129 mg/dL.

### **HAS THE PATIENT EXPERIENCED AN INCREASE IN SYMPTOM SEVERITY OR FREQUENCY?**

Patients who have had a recent increase in symptom severity or frequency may have an acute coronary syndrome or progression of CAD. Patients who have had a significant increase in symptoms within the preceding two weeks should be evaluated in Module B. Patients who have had a gradual worsening of symptoms >2 weeks warrant further evaluation.

### **DID PATIENT HAVE A RECENT (<6 MONTHS) REVASCULARIZATION?**

Patients who have had a recent revascularization procedure and have recurrent angina are a special subset of patients with stable angina. Recurrent angina following a revascularization procedure may represent either restenosis, following percutaneous coronary intervention, or graft failure, following a coronary artery bypass graft. Therefore, patients who present with recurrent typical angina within 6 months of revascularization should be referred to a cardiologist for further evaluation and possible coronary angiography.

### **Assessment of Left Ventricular Function (LVF) (e.g., Signs or Symptoms of CHF)**

Left ventricular systolic dysfunction is one of the strongest predictors of both increased mortality and increased morbidity, including Congestive Heart Failure (CHF) and malignant arrhythmias. Pharmacologic therapy and/or revascularization can favorably affect this clinical course.

Accepted criteria for at least one assessment of LVF in patients with known CAD include the following:

- Symptoms of CHF (e.g., orthopnea or paroxysmal nocturnal dyspnea)
- Significant impairment or recent decrement in exercise tolerance, due to dyspnea or fatigue
- Physical signs of CHF (e.g., elevated jugular venous pressure, unexplained pulmonary rales, laterally displaced point of maximal impulse, and S3 gallop)

- Cardiomegaly on chest x-ray
- History of prior MI or pathologic Q-waves on the ECG

Repeat assessment is indicated if there has been an unexplained worsening of CHF symptoms or signs or a significant decrement in exercise tolerance, due to fatigue or dyspnea. Routine reassessment of LVF in stable patients is not indicated.

It is also important to recognize that patients with normal or near-normal LVF (ejection fraction [EF] >0.40) may experience symptoms of heart failure due to diastolic LV dysfunction. Such patients may also experience symptomatic benefit from diuretics, beta-blockers or nitrates, but there is little or no evidence of benefit from calcium channel-blockers or ACE-inhibitors. For specific recommendations for the treatment of diastolic heart failure, the provider is referred to the ACC/AHA Task Force on Practice Guidelines, Guidelines for the Evaluation and Management of Heart Failure (2001).

Select the most appropriate method for the assessment of LV systolic function. LV systolic function may be assessed by contrast angiography at cardiac catheterization, two-dimensional cardiac ultrasound, and radionuclide ventriculography.

Of note, Silver et al. (1994) developed a clinical rule to identify patients with prior MI who had LVEF >0.40. They found a positive predictive value of 98 percent in those patients who have ALL of the following characteristics:

- An interpretable ECG (no left bundle branch block, ventricular pacing, or left ventricular hypertrophy with strain pattern)
- No prior Q-wave MI
- No history of CHF
- Index MI which is not a Q-wave anterior infarction

### **NON-INVASIVE RISK STRATIFICATION**

Patients with known IHD and angina who have not experienced any recent changes in symptom severity or frequency should undergo non-invasive risk stratification.

A stress test is not required if:

- The patient has had a prior stress test (or recent angiography).
- The patient has been free of angina symptoms since the most recent stress test or angiography.

Risk-stratification generally includes both cardiac stress testing and an assessment of resting left ventricular function. *Routine periodic stress testing (e.g., yearly treadmill) is not indicated in patients with stable angina.*

Stress tests will not be of benefit to the following patients for whom the results of stress testing are unlikely to change the treatment regimen:

- Patients with limited life expectancy from other conditions
- Patients with comorbidities that limit therapy or magnify the risk of procedures
- Patients with an established diagnosis of CAD, who are unwilling to consider alternatives to medical therapy

Patients with intermediate- or high-risk features (see Table) found on non-invasive risk testing should be referred to Cardiology for further evaluation and possible coronary angiography. Patients without intermediate- or high-risk features and normal non-invasive test results should be evaluated for non-cardiac causes of chest pain. Patients with evidence of CAD on non-invasive testing but without intermediate- or high-risk features should be treated according to Module G.

## IS THE RESPONSE TO THERAPY UNSATISFACTORY?

Even after optimizing anti-anginal medications, a patient may require revascularization if the symptoms are not resolved or if the patient is dissatisfied with his or her functional status or symptoms.

In addition to reducing mortality, the goal of IHD therapy should be to return the patient to as nearly a normal quality of life as possible. Patients who do not meet this goal of medical therapy and are willing to accept the risks of revascularization, in the hope of meeting this goal, may be offered invasive evaluation.

The patient for whom medical therapy results in satisfactory control of symptoms should be followed periodically. The follow-up of the IHD patient, focusing on interventions for secondary prevention, is included in Module G.

<b>Cardiac Stress Test</b>
<b>High-Risk Findings</b>
<ul style="list-style-type: none"> <li>• Duke treadmill score less than or equal to -11 (estimated annual mortality &gt;3%)</li> <li>• Large stress-induced perfusion defect</li> <li>• Stress-induced, multiple perfusion defects of moderate size</li> <li>• Large fixed perfusion defect with LV dilation or increased lung uptake (thallium-201)</li> <li>• Stress-induced, moderate perfusion defect with LV dilation or increased lung uptake (thallium-201)</li> <li>• Echocardiographic wall motion abnormality involving &gt;2 segments at <math>\leq 10</math> mg/kg/min dobutamine or HR &lt;120/min</li> </ul>
<b>Intermediate-Risk Findings</b>
<ul style="list-style-type: none"> <li>• Duke treadmill score (greater than -11 and less than 5) (estimated annual mortality 1-3%)</li> <li>• Moderate stress induced perfusion defect without LV dilation or increased lung uptake</li> <li>• Limited stress echocardiographic ischemia with wall motion abnormality involving <math>\leq 2</math> segments at higher doses of dobutamine (&gt;10 mg/kg/min dobutamine)</li> </ul>